LISTING OF CLAIMS:

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Please amend claims 32, 40 and 67 as follows:

1. (Previously Presented) A signal processing method for processing a visible light image signal and infrared image signal obtained by illuminating a transparent document with light beams respectively coming from a visible light source for mainly emitting visible light and an infrared light source for mainly emitting infrared light, and photoelectrically converting optical images of the transparent document, comprising:

an edge correction step of performing edge correction of the infrared image signal and generating an edge-corrected infrared image signal;

a calculation step of calculating a threshold value on the basis of the edge-corrected infrared image signal;

an extraction step of comparing the threshold value calculated in the calculation step with the edge-corrected infrared image signal, and extracting edge-corrected infrared image signal components not more than the threshold value; and

an interpolation step of executing an interpolation process of the visible light image signal on the basis of the infrared image signal components extracted in the extraction step,

wherein an edge correction amount in the edge correction step is set in association with the deterioration of MTF due to chromatic aberration of an optical focusing system between visible light and infrared light.

2.-4. (Canceled)

5. (Previously Presented) The method according to claim 1, wherein the calculation step includes a generation step of generating a histogram on the basis of the edge-corrected infrared image signal, and calculates the threshold on the basis of the histogram generated in the generation step.

6. (Canceled).

7. (Previously Presented) The method according to claim 32, wherein the generation step includes the step of generating a histogram of frequencies of occurrence of respective gray levels of the infrared image signal.

8. (Original) The method according to claim 7, wherein the calculation step includes the step of calculating the threshold value by subtracting a value given by a predetermined relation from a gray level that represents the infrared image signal.

9. (Original) The method according to claim 8, wherein the calculation step further comprises: a step of calculating a standard deviation; and a step of determining the value to be subtracted on the basis of the standard deviation.

10. (Original) The method according to claim 7, wherein the calculation step comprises: a step of calculating an intermediate value of the frequencies of occurrence of the histogram; and a step of calculating the threshold value by subtracting a predetermined value from a gray level corresponding to the intermediate value.

11. (Original) The method according to claim 10, wherein the predetermined value is pre-stored.

12. (Original) The method according to claim 10, wherein the predetermined value is externally input.

13. (Original) The method according to claim 10, wherein the calculation step further comprises: a step of calculating a standard deviation; and a step of determining the predetermined value on the basis of the standard deviation.

14. (Original) The method according to claim 7, wherein the calculation step comprises: a step of calculating a maximum frequency of occurrence of the histogram; and a step of calculating the threshold value by subtracting a predetermined value from a gray level corresponding to the maximum frequency of occurrence of the histogram.

15. (Original) The method according to claim 14, wherein the predetermined value is pre-stored.

16. (Original) The method according to claim 14, wherein the predetermined value is externally input.

17. (Original) The method according to claim 14, wherein the calculation step further comprises: a step of calculating a standard deviation; and a step of determining the predetermined value on the basis of the standard deviation.

18. (Original) The method according to claim 7, wherein the calculation step comprises: a step of calculating a maximum gray level of the histogram; and a step of calculating the threshold value by subtracting a predetermined value from the maximum gray level.

19. (Original) The method according to claim 18, wherein the predetermined value is pre-stored.

20. (Original) The method according to claim 18, wherein the predetermined value is externally input.

21. (Original) The method according to claim 18, wherein the calculation step further comprises: a step of calculating a standard deviation; and a step of determining the

predetermined value on the basis of the standard deviation.

22. (Original) The method according to claim 7, wherein the calculation step comprises: a step of calculating an average gray level of the histogram; and a step of calculating the threshold value by subtracting a predetermined value from the average gray level.

23. (Original) The method according to claim 22, wherein the predetermined value is pre-stored.

24. (Original) The method according to claim 22, wherein the predetermined value is externally input.

25. (Original) The method according to claim 22, wherein the calculation step further comprises: a step of calculating a standard deviation; and a step of determining the predetermined value on the basis of the standard deviation.

26. (Original) The method according to claim 7, wherein the calculation step comprises: a step of calculating a maximum gray level of the histogram; and a step of calculating the threshold value by multiplying the maximum gray level by a predetermined value.

27. (Original) The method according to claim 26, wherein the predetermined value is pre-stored.

28. (Original) The method according to claim 26, wherein the predetermined value is externally input.

29. (Original) The method according to claim 7, wherein the calculation step comprises: a step of calculating a maximum gray level of the histogram; a step of calculating an average gray level of the histogram; and a step of calculating the threshold value by subtracting a product, which is obtained by multiplying a difference between the maximum gray level and the average gray level by a predetermined value, from the average gray level.

30. (Original) The method according to claim 29, wherein the predetermined value is pre-stored.

31. (Original) The method according to claim 29, wherein the predetermined value is externally input.

32. (Currently Amended) A signal processing method for processing a visible light image signal and infrared image signal obtained by illuminating a transparent document with light beams respectively coming from a visible light source for mainly emitting visible light and an infrared light source for mainly emitting infrared light, and photoelectrically converting optical images of the transparent document, comprising:

a segmentation step of segmenting the infrared image signal into a plurality of blocks[[,]];

a generation step of generating a histogram for each of the plurality of blocks on the basis of the infrared image signal;

a calculation step of calculating a threshold value for each of the plurality of blocks on the basis of the histogram generated in the generation step;

an extraction step of comparing the threshold value calculated in the calculation step with the infrared image signal, and extracting infrared image signal components not more than the threshold value, for each of the plurality of blocks; and

an interpolation step of executing an interpolation process of the visible light image signal on the basis of the infrared image signal components extracted in the extraction step.

33. (Previously Presented) A signal processing method for processing a visible light image signal and infrared image signal obtained by illuminating a transparent document

with light beams respectively coming from a visible light source for mainly emitting visible light and an infrared light source for mainly emitting infrared light, and photoelectrically converting optical images of the transparent document, comprising:

a detection step of detecting signal components corresponding to a holder for holding the transparent document from the infrared image signal;

a replacement step of replacing, when the signal components corresponding to the holder are detected in the detection step, the signal components by a predetermined signal value;

a generation step of generating a histogram on the basis of the infrared image signal that has undergone the replacement step;

a calculation step of calculating a threshold value on the basis of the histogram generated in the generation step;

an extraction step of comparing the threshold value calculated in the calculation step with the infrared image signal that has not undergone the replacement step, and extracting infrared image signal components not more than the threshold value; and

an interpolation step of executing an interpolation process of the visible light image signal on the basis of the infrared image signal components extracted in the extraction step.

34. (Original) The method according to claim 33, further comprising a step of calculating an average value of the infrared image signal, wherein the predetermined signal value replaced in the replacement step is the average value.

35. (Previously Presented) A signal processing method for processing a visible light image signal and infrared image signal obtained by illuminating a transparent document

with light beams respectively coming from a visible light source for mainly emitting visible light and an infrared light source for mainly emitting infrared light, and photoelectrically converting optical images of the transparent document, comprising:

a detection step of detecting signal components corresponding to a holder for holding the transparent document from the infrared image signal;

a step of removing, when the signal components corresponding to the holder are detected in the detection step, the signal components;

a generation step of generating a histogram on the basis of the infrared image signal that has undergone the removing step;

a calculation step of calculating a threshold value on the basis of the histogram generated in the generation step;

an extraction step of comparing the threshold value calculated in the calculation step with the infrared image signal that has not undergone the removing step, and extracting infrared image signal components not more than the threshold value; and

an interpolation step of executing an interpolation process of the visible light image signal on the basis of the infrared image signal components extracted in the extraction step.

36. (Previously Presented) A signal processing apparatus for processing a visible light image signal and infrared image signal obtained by illuminating a transparent document with light beams respectively coming from a visible light source for mainly emitting visible light and an infrared light source for mainly emitting infrared light, and photoelectrically converting optical images of the transparent document, comprising:

an edge correction unit adapted to perform edge correction of the infrared image signal and generating an edge-corrected infrared image signal;

a calculation unit adapted to calculate a threshold value on the basis of the edge-corrected infrared image signal;

an extraction unit adapted to compare the threshold value calculated by said calculation means with the edge-corrected infrared image signal, and extract the edge-corrected infrared image signal components not more than the threshold value; and

an interpolation unit adapted to execute an interpolation process of the visible light image signal on the basis of the edge-corrected infrared image signal components extracted by said extraction means,

wherein an edge correction amount of said edge correction unit is set in association with the deterioration of the MTF due to chromatic aberration of an optical focusing system between visible light and infrared light.

37.- 39. (Canceled)

40. (Currently Amended) The apparatus according to claim 36, [[,]] wherein said calculation unit generates a histogram on the basis of the edge-corrected infrared image signal, and calculates the threshold on the basis of the histogram.

41. (Canceled).

42. (Previously Presented) The apparatus according to claim 67, wherein said generation unit generates a histogram of frequencies of occurrence of respective gray levels of the infrared image signal.

43. (Previously Presented) The apparatus according to claim 42, wherein said calculation unit calculates the threshold value by subtracting a value given by a predetermined

relation from a gray level that represents the infrared image signal.

44. (Previously Presented) The apparatus according to claim 43, wherein said calculation unit further comprises:

a unit adapted to calculate a standard deviation; and

a unit adapted to determine the value to be subtracted on the basis of the standard deviation.

45. (Previously Presented) The apparatus according to claim 42, wherein said calculation unit comprises:

a unit adapted to calculate an intermediate value of the frequencies of occurrence of the histogram; and

a unit adapted to calculate the threshold value by subtracting a predetermined value from a gray level corresponding to the intermediate value.

46. (Original) The apparatus according to claim 45, wherein the predetermined value is pre-stored.

47. (Original) The apparatus according to claim 45, wherein the predetermined value is externally input.

48. (Previously Presented) The apparatus according to claim 45, wherein said calculation unit further comprises:

a unit adapted to calculate a standard deviation; and

a unit adapted to determine the predetermined value on the basis of the standard deviation.

49. (Previously Presented) The apparatus according to claim 42, wherein said calculation unit comprises:

a unit adapted to calculate a maximum frequency of occurrence of the histogram; and

a unit adapted to calculate the threshold value by subtracting a predetermined value from a gray level corresponding to the maximum frequency of occurrence of the histogram.

50. (Original) The apparatus according to claim 49, wherein the predetermined value is pre-stored.

51. (Original) The apparatus according to claim 49, wherein the predetermined value is externally input.

52. (Previously Presented) The apparatus according to claim 49, wherein said calculation unit further comprises:

a unit adapted to calculate a standard deviation; and

a unit adapted to determine the predetermined value on the basis of the standard deviation.

53. (Previously Presented) The apparatus according to claim 42, wherein said calculation unit comprises:

a unit adapted to calculate a maximum gray level of the histogram; and

a unit adapted to calculate the threshold value by subtracting a predetermined value from the maximum gray level.

54. (Original) The apparatus according to claim 53, wherein the predetermined value is pre-stored.

55. (Original) The apparatus according to claim 53, wherein the predetermined value is externally input.

56. (Previously Presented) The apparatus according to claim 53, wherein said calculation unit further comprises:

a unit adapted to calculate a standard deviation; and

a unit adapted to determine the predetermined value on the basis of the standard deviation.

57. (Previously Presented) The apparatus according to claim 42, wherein said calculation unit comprises:

a unit adapted to calculate an average gray level of the histogram; and

a unit adapted to calculate the threshold value by subtracting a predetermined value from the average gray level.

58. (Original) The apparatus according to claim 57, wherein the predetermined value is pre-stored.

59. (Original) The apparatus according to claim 57, wherein the predetermined value is externally input.

60. (Previously Presented) The apparatus according to claim 57, wherein said calculation unit further comprises:

a unit adapted to calculate a standard deviation; and

a unit adapted to determine the predetermined value on the basis of the standard deviation.

61. (Previously Presented) The apparatus according to claim 42, wherein said calculation unit comprises:

a unit adapted to calculate a maximum gray level of the histogram; and

a unit adapted to calculate the threshold value by multiplying the maximum gray level by a predetermined value.

62. (Original) The apparatus according to claim 61, wherein the predetermined value is pre-stored.

63. (Original) The apparatus according to claim 61, wherein the predetermined value is externally input.

64. (Previously Presented) The apparatus according to claim 42, wherein said calculation unit comprises:

a unit adapted to calculate a maximum gray level of the histogram;

a unit adapted to calculate an average gray level of the histogram; and

a unit adapted to calculate the threshold value by subtracting a product, which is obtained by multiplying a difference between the maximum gray level and the average gray level by a predetermined value, from the average gray level.

65. (Original) The apparatus according to claim 64, wherein the predetermined value is pre-stored.

66. (Original) The apparatus according to claim 64, wherein the predetermined value is externally input.

67. (Currently Amended) A signal processing ~~method~~ apparatus for processing a visible light image signal and infrared image signal obtained by illuminating a transparent document with light beams respectively coming from a visible light source for mainly emitting visible light and an infrared light source for mainly emitting infrared light, and photoelectrically converting optical images of the transparent document, comprising:

a segmentation unit adapted to segment the infrared image signal into a plurality of blocks;

a generation unit adapted to generate a histogram for each of the plurality of blocks on the basis of the infrared image signal;

a calculation unit adapted to calculate a threshold value for each of the plurality of blocks on the basis of the histogram generated in the generation ~~step~~ unit;

an extraction unit adapted to compare the threshold value calculated in the calculation unit with the infrared image signal, and extract infrared image signal components not more than the threshold value, for each of the plurality of blocks; and

an interpolation unit adapted to execute an interpolation process of the visible light image signal on the basis of the infrared image signal components extracted by the extraction unit.

68. (Previously Presented) A signal processing apparatus for processing a visible light image signal and infrared image signal obtained by illuminating a transparent document with light beams respectively coming from a visible light source for mainly emitting visible light and an infrared light source for mainly emitting infrared light and photoelectrically converting optical images of the transparent document comprising:

a detection unit adapted to detect signal components corresponding to a holder for holding the transparent document from the infrared image signal;

a replacement unit adapted to, when said detection unit detects the signal components corresponding to the holder, replace the signal components by a predetermined signal value;

a generation unit adapted to generate a histogram on the basis of the infrared image signal that has undergone the replacement process by said replacement unit;

a calculation unit adapted to calculate a threshold value on the basis of the histogram generated in the generation step;

an extraction unit adapted to compare the threshold value calculated by the calculation unit with the infrared image signal that has not undergone the replacement process, and extract infrared image signal components not more than the threshold value; and

an interpolation unit adapted to execute an interpolation process of the visible light image signal on the basis of the infrared image signal components extracted by the extraction unit.

69. (Previously Presented) The apparatus according to claim 68, further comprising a unit adapted to calculate an average value of the infrared image signal, wherein the predetermined signal value replaced by said replacement unit is the average value.

70. (Previously Presented) A signal processing method for processing a visible light image signal and infrared image signal obtained by illuminating a transparent document with light beams respectively coming from a visible light source for mainly emitting visible light and an infrared light source for mainly emitting infrared light, and photoelectrically converting optical images of the transparent document, comprising:

a detection unit adapted to detect signal components corresponding to a holder for holding the transparent document from the infrared image signal components;

a removing unit adapted to, when said detection unit detects the signal components corresponding to the holder, removing the signal components;

a generation unit adapted to generate a histogram on the basis of the infrared image signal that has undergone the removing process by said removing unit;

a calculation adapted to calculate a threshold value on the basis of the histogram generated in the generation step;

an extraction unit adapted to compare the threshold value calculated by the calculation unit with the infrared image signal that has not undergone the removing process, and extract infrared image signal components not more than the threshold value; and

an interpolation unit adapted to execute an interpolation process of the visible light image signal on the basis of the infrared image signal components extracted by said extraction unit.

71. (Previously Presented) An image reading apparatus capable of reading a transparent document, comprising:

a visible light source that mainly emits visible light;

an infrared light source that mainly emits infrared light;

a photoelectric converter adapted to convert an optical image into an electrical signal;

an edge correction unit adapted to perform edge correction of an infrared image signal obtained via said photoelectric converter by illuminating a transparent document with light emitted by said infrared light source and generating an edge-corrected infrared image signal;

a calculation unit adapted to calculate a threshold value on the basis of the edge-corrected infrared image signal;

an extraction unit adapted to compare the threshold value calculated by said calculation means with the edge-corrected infrared image signal, and extract the edge-corrected infrared image signal components not more than the threshold value; and

an interpolation unit adapted to execute an interpolation process of a visible light image signal, obtained via said photoelectric converter by illuminating the transparent document with light emitted by said visible light source, on the basis of the edge-corrected infrared image signal components extracted by said extraction means,

wherein an edge correction amount of said edge correction unit is set in association with the deterioration of the MTF due to chromatic aberration of an optical focusing system between visible light and infrared light.

72.- 74. (Canceled)

75. (Previously Presented) The apparatus according to claim 71, wherein said calculation unit generates a histogram on the basis of the edge-corrected infrared image signal, and calculates the threshold on the basis of the histogram.

76. (Canceled)

77. (Previously Presented) The apparatus according to claim 102, wherein said generation unit generates a histogram of frequencies of occurrence of respective gray levels of the infrared image signal.

78. (Previously Presented) The apparatus according to claim 77, wherein said calculation unit calculates the threshold value by subtracting a value given by a predetermined relation from a gray level that represents the infrared image signal.

79. (Previously Presented) The apparatus according to claim 78, wherein said calculation unit further comprises:

a unit adapted to calculate a standard deviation; and

a unit adapted to determine the value to be subtracted on the basis of the standard deviation.

80. (Previously Presented) The apparatus according to claim 77, wherein said calculation unit comprises:

a unit adapted to calculate an intermediate value of the frequencies of occurrence of the histogram; and

a unit adapted to calculate the threshold value by subtracting a predetermined value from a gray level corresponding to the intermediate value.

81. (Original) The apparatus according to claim 80, wherein the predetermined value is pre-stored.

82. (Original) The apparatus according to claim 80, wherein the predetermined value is externally input.

83. (Previously Presented) The apparatus according to claim 80, wherein said calculation unit further comprises:

a unit adapted to calculate a standard deviation; and

a unit adapted to determine the predetermined value on the basis of the standard deviation.

84. (Previously Presented) The apparatus according to claim 77, wherein said calculation unit comprises:

a unit adapted to calculate a maximum frequency of occurrence of the histogram; and

a unit adapted to calculate the threshold value by subtracting a predetermined value from a gray level corresponding to the maximum frequency of occurrence of the histogram.

85. (Original) The apparatus according to claim 84, wherein the predetermined value is pre-stored.

86. (Original) The apparatus according to claim 84, wherein the predetermined value is externally input.

87. (Previously Presented) The apparatus according to claim 84, wherein said calculation unit further comprises:

a unit adapted to calculate a standard deviation; and

a unit adapted to determine the predetermined value on the basis of the standard deviation.

88. (Previously Presented) The apparatus according to claim 77, wherein said calculation unit comprises:

a unit adapted to calculate a maximum gray level of the histogram; and

a unit adapted to calculate the threshold value by subtracting a predetermined value from the maximum gray level.

89. (Original) The apparatus according to claim 88, wherein the predetermined value is pre-stored.

90. (Original) The apparatus according to claim 88, wherein the predetermined value is externally input.

91. (Previously Presented) The apparatus according to claim 88, wherein said calculation unit further comprises:

a unit adapted to calculate a standard deviation; and

a unit adapted to determine the predetermined value on the basis of the standard deviation.

92. (Previously Presented) The apparatus according to claim 77, wherein said calculation unit comprises:

a unit adapted to calculate an average gray level of the histogram; and

a unit adapted to calculate the threshold value by subtracting a predetermined value from the average gray level.

93. (Original) The apparatus according to claim 92, wherein the predetermined value is pre-stored.

94. (Original) The apparatus according to claim 92, wherein the predetermined value is externally input.

95. (Previously Presented) The apparatus according to claim 92, wherein said calculation further comprises:

a unit adapted to calculate a standard deviation; and

a unit adapted to determine the predetermined value on the basis of the standard deviation.

96. (Previously Presented) The apparatus according to claim 77, wherein said calculation unit comprises:

a unit adapted to calculate a maximum gray level of the histogram; and

a unit adapted to calculate the threshold value by multiplying the maximum gray level by a predetermined value.

97. (Original) The apparatus according to claim 96, wherein the predetermined

value is pre-stored.

98. (Original) The apparatus according to claim 96, wherein the predetermined value is externally input.

99. (Previously Presented) The apparatus according to claim 77, wherein said calculation unit comprises:

a unit adapted to calculate a maximum gray level of the histogram;

a unit adapted to calculate an average gray level of the histogram; and

a unit adapted to calculate the threshold value by subtracting a product, which is obtained by multiplying a difference between the maximum gray level and the average gray level by a predetermined value, from the average gray level.

100. (Original) The apparatus according to claim 99, wherein the predetermined value is pre-stored.

101. (Original) The apparatus according to claim 99, wherein the predetermined value is externally input.

102. (Previously Presented) An image reading apparatus capable of reading a transparent document, comprising:

a visible light source that mainly emits visible light;

an infrared light source that mainly emits infrared light;

a photoelectric converter adapted to convert an optical image into an electrical signal;

a segmentation unit adapted to segment an infrared image signal obtained via said photoelectric converter by illuminating a transparent document with light emitted by said infrared light source into a plurality of blocks,

a generation unit adapted to generate a histogram for each of the plurality of blocks on the basis of the infrared image signal;

a calculation unit adapted to calculate a threshold value for each of the plurality of blocks on the basis of the histogram generated by the generation unit;

an extraction unit adapted to compare the threshold value calculated by the calculation unit with the infrared image signal, and extracting infrared image signal components not more than the threshold value, for each of the plurality of blocks; and

an interpolation unit adapted to execute an interpolation process of the visible light image signal obtained via said photoelectric converter by illuminating the transparent document with light emitted by said visible light source, on the basis of the infrared image signal components extracted by said extraction unit.

103. (Previously Presented) An image reading apparatus capable of reading a transparent document, comprising:

a visible light source that mainly emits visible light;

an infrared light source that mainly emits infrared light;

a photoelectric converter adapted to convert an optical image into an electrical signal;

a detection unit adapted to detect signal components corresponding to a holder for holding the transparent document from an infrared image signal obtained via said photoelectric converter by illuminating a transparent document with light emitted by said infrared light source;

a replacement, unit adapted to, when said detection unit detects the signal components corresponding to the holder, replace the signal components by a predetermined signal value;

a generation unit adapted to generate a histogram on the basis of the infrared image signal that has undergone the replacement process by said replacement unit;

a calculation unit adapted to calculate a threshold value on the basis of the histogram generated by the generation unit;

an extraction unit adapted to compare the threshold value calculated by said calculation unit with the infrared image signal, and extracting infrared image signal components not more than the threshold value; and

an interpolation unit adapted to execute an interpolation process of a visible light image signal obtained via said photoelectric converter by illuminating the transparent document with light emitted by said visible light source, on the basis of the infrared image signal components extracted by said extraction unit.

104. (Previously Presented) The apparatus according to claim 103, further comprising a unit adapted to calculate an average value of the infrared image signal, wherein the predetermined signal value replaced by said replacement unit is the average value.

105. (Previously Presented) An image reading apparatus capable of reading a transparent document, comprising:

a visible light source that mainly emits visible light;

an infrared light source that mainly emits infrared light;

a photoelectric converter adapted to convert an optical image into an electrical signal;

a detection unit adapted to detect signal components corresponding to a holder for holding the transparent document from an infrared image signal obtained via said photoelectric converter by illuminating a transparent document with light emitted by said infrared light source;

a removing unit adapted to, when said detection unit detects the signal components corresponding to the holder, removing the signal components;

a generation unit adapted to generate a histogram on the basis of the infrared image signal that has undergone the removing process by said removing unit;

a calculation unit adapted to calculate a threshold value on the basis of the histogram generated by said generation unit;

an extraction unit adapted to compare the threshold value calculated by said calculation unit with the infrared image signal, and extract infrared image signal components not more than the threshold value; and

an interpolation unit adapted to execute an interpolation process of a visible light image signal obtained via said photoelectric converter by illuminating the transparent document with light emitted by said visible light source, on the basis of the infrared image signal components extracted in the extraction unit .

106. (Previously Presented) A computer program product comprising a computer usable medium having computer readable program code means embodied in said medium for a signal processing method for processing a visible light image signal and infrared image signal obtained by illuminating a transparent document with light beams respectively coming from a visible light source for mainly emitting visible light and an infrared light source for mainly

emitting infrared light, and photoelectrically converting optical images of the transparent document, said product including:

first computer readable program code means for segmenting the infrared image signal into a plurality of blocks;

second computer readable program code means for generating a histogram for each of the plurality of blocks on the basis of the infrared image signal;

third computer readable program code means for calculating a threshold value for each of the plurality of blocks on the basis of the generated histogram;

fourth computer readable program code means for comparing the calculated threshold value with infrared image signal, and extracting infrared image signal components not more than the threshold value, for each of the plurality of blocks; and

fifth computer readable program code means for executing an interpolation process of the visible light image signal on the basis of the extracted infrared image signal components.